



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

U.S. PATENT APPLICATION SERIAL NO.09/905,761
FILING DATE 13 July 2001
INVENTORS Gaylon S. Campbell, et al.
ASSIGNEE Decagon Devices, Inc.
GROUP ART UNIT 2856
EXAMINER Andre K. Jackson
ATTORNEY'S DOCKET NO. 46263.0004
TITLE "Moisture Detection Apparatus and Method"

§1.132 AFFIDAVIT OF GAYLON S. CAMPBELL

To: Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

From: L. Grant Foster
HOLLAND & HART LLP
555 - 17th Street, Suite 3200
P.O. Box 8749
Denver, Colorado 80201
Telephone: (801) 595-7830
Facsimile: (801) 364-9124

I, GAYLON S. CAMPBELL, declare that:

1. I am the inventor named on the patent application referenced above and the inventor of the subject matter described and claimed therein. I have reviewed and understand the contents of the above-identified application and the Office Action dated January 29, 2004.
2. I hold a Ph.D. in soil science and spent nearly 30 years as a professor of environmental biophysics and soil physics in Washington State University's crop and soil sciences department.
3. I am skilled in the art of soil sciences, including moisture measurement.
4. The word "phase" only has meaning to one of skill in the art of soil sciences and moisture measurement when comparing at least two wave trains of equal

frequency. The term “phase” has no meaning with reference to a single waveform. Phase differences are usually expressed as an angle.

5. I have studied U.S. Patent No. 5,148,125 issued to Woodhead et al., U.S. Patent No. 5,969,620 issued to Okulov, Austrian Patent No. AT 403213B issued to Kaufmann, U.S. Patent No. 3,968,428 issued to Numoto, and U.S. Patent No. 3,771,548 issued to Rauchwerger, (collectively “the cited references”).
6. None of cited references discloses a phase detector as the term “phase detector” is understood by those of skill in the art.
7. One of skill in the art would have no motivation to combine the teachings of Woodhead et al. with the teachings of Okulov, nor does the combination of Woodhead et al. and Okulov arrive at the claimed invention.
8. The exclusive OR devices in the Okulov reference perform logical functions, not phase detection functions.
9. Kauffmann does not disclose a transmission line or a phase detector.
10. One of skill in the art would have no motivation to combine Kaufmann with Woodhead et al., and no expectation of success by attempting a combination of the teachings of each. One of skill in the art could not modify Kaufmann to include time domain reflectometry according to Woodhead et al. and arrive at the claimed invention.
11. Rauchwerger does not disclose a transmission line, a phase detector, or an output signal indicative of phase differences.
12. Rauchwerger and Woodhead et al. comprise two entirely different approaches to measuring soil moisture. One of skill in the art would have no motivation to

combine the teachings of each, nor would one of skill in the art have a reasonable expectation of successfully combining the two entirely different approaches disclosed by the two references.

13. Numoto discloses soil resistance measurements, but does not disclose capacitance measurements or phase measurements.
14. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the above-referenced application or any patent issuing thereon.

27 APR 2004
DATE


GAYLON S. CAMPBELL